

## CLAIMS:

1. A system for magnetic resonance imaging, comprising:
  - a substantially cylindrical cavity (2);
  - wherein the cavity (2) has an axis of symmetry in the direction of a z-axis;
  - wherein a subject (3) can be examined within the cavity;
  - 5 - wherein the subject (3) has a conductance which is not isotropic in an xy-plane which is perpendicular to the z-axis;  
characterized in that an electrically conductive material (4) is placed within the cavity (2), wherein the material (4) has a conductivity and a thickness which render the total conductance in the xy-plane within the cavity to be isotropic.
- 10 2. A system according to claim 1, characterized in that the system is a magnetic resonance imaging apparatus or a radio frequency (RF) coil for magnetic resonance imaging.
3. A system according to claim 2, characterized in that at least a part of the  
15 material (4) is attached to an inner wall (5) of the cylindrical cavity (2).
4. A system according to claim 1, characterized in that at least a part of the material (4) is attached to a bottom (6) of a substantially plane surface (7) on which the subject (3) can be positioned.  
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5. A system according to claim 4, characterized in that the substantially plane surface (7) is part of a patient's bed.
6. A system according to claim 3, 4 or 5, characterized in that the electrically  
25 conductive material (4) is removably attached within the cavity (2).
7. A system according to claim 1, characterized in that the material (4) is substantially above and below a substantially plane surface (7) on which the subject (3) can be positioned.

8. A system according to claim 1, characterized in that the material (4) has a planar resistance between about  $5 \Omega$ . and about  $2\Omega$ .

5 9. A system according to claim 7, characterized in that the material above the subject (3) has a planar resistance between about  $5 \Omega$ . and about  $10\Omega$ .

10. A system according to claim 7, characterized in that the material below the subject (3) has a planar resistance between about  $12 \Omega$ . and about  $1\Omega$ .

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11. A system according to claim 1, characterized in that the material (4) is a sheet (8) being covered by a conductive layer (9).

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12. A system according to claim 11, characterized in that only predetermined parts of the sheet (8) are covered by a conductive layer (9).

13. A system according to claim 1, characterized in that it is arranged to operate with magnetic fields at or above 3 tesla.